Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Office of Engineering and Technology Invites Comments on Technological Advisory Council (TAC) White Paper and Recommendations for Improving Receiver Performance	)	ET Docket No. 13-101

COMMENTS OF CTIA – THE WIRELESS ASSOCIATION®

I. INTRODUCTION AND SUMMARY

CTIA – The Wireless Association® ("CTIA")[1] hereby offers comment in response to the Commission's Technological Advisory Council ("TAC") white paper ("TAC White Paper") on receiver performance issues.[2] The Office of Engineering and Technology's ("OET") Public Notice also seeks comment on the overall interference limits policy approach proposed in the white paper, information on the practical effects of various receiver standards options, and the role of multi-stakeholder organizations and the FCC.[3] CTIA is proud to report on the many efforts made by the U.S. wireless industry to design and deploy robust receivers. CTIA credits this success to competitive market forces in the wireless industry, the use of industry standards created through stakeholder consensus, and the need to be as efficient as possible in maximizing

[1] CTIA – The Wireless Association® is the international organization of the wireless communications industry for both wireless carriers and manufacturers. Membership in the organization covers Commercial Mobile Radio Service ("CMRS") providers and manufacturers, including cellular, Advanced Wireless Service, 700 MHz, broadband PCS, and ESMR, as well as providers and manufacturers of wireless data services and products. More information about CTIA is available on the Association's website at http://www.ctia.org/aboutCTIA/.

[2] *Office of Engineering and Technology Invites Comments on Technological Advisory Council (TAC) White Paper and Recommendations for Improving Receiver Performance*, Public Notice, ET Docket No. 13-101 (April 22, 2013) ("Public Notice").

[3] *Id.* at 2.

the use of scarce spectrum resources. CTIA believes that receiver performance is a key element to successful use of electromagnetic spectrum, and it supports efforts to enhance receiver performance. CTIA believes that the TAC White Paper provides a potential framework for encouraging receiver performance where incentives have not spurred efficiency or accounted for future uses. However, CTIA notes that any initial efforts to implement a new receiver performance benchmark should be carefully tailored, and that a multi-stakeholder group process should be used to explore potential approaches.

II. THE U.S. WIRELESS INDUSTRY IS AT THE FOREFRONT OF DESIGNING AND DEPLOYING ROBUST RECEIVERS AS A RESULT OF MARKET FORCES AND INDUSTRY CONSENSUS.

As an initial matter, CTIA notes that – independent of any regulatory mandate – the U.S. wireless industry is at the forefront of developing robust receivers, driven by market forces and industry consensus. Indeed, current wireless standards developed by stakeholder bodies have included receiver performance standards. For example, recent standards have included blocking requirements and other requirements governing resistance to interference. Utilizing industry standards such as these has allowed the wireless industry to develop receivers that are extremely resistant to interference without any need for government oversight and regulation.

The wireless industry remains robustly competitive. This intense competition, together with industry standards efforts, has enabled equipment providers to innovate rapidly and frequently introduce advanced mobile and base station products and services. In recent years, the U.S. mobile device marketplace has seen dramatic swings in market share rewarding the best products. There are currently at least 32 different device manufacturers offering over 630 different handsets and devices in the U.S.[4] This competition is driving incredible advances in

[4] Comments of CTIA – The Wireless Association®, WT Docket No. 13-135, at 20 (2013).

device quality, including robustness in the face of interference. In this environment, there is simply no way for a device manufacturer to create a low-quality product and expect to be able to compete.

The current mobile data traffic environment also provides the wireless industry with strong incentives to deploy robust receivers. In recent years, CTIA has thoroughly documented the sharp rise of data usage and corresponding "spectrum crunch" facing operators of U.S. wireless networks. Given this incredible increase in data usage and capacity demands on wireless networks, providers have needed to ensure that all spectrum licensed is used in the most effective and efficient manner. The Commission's policy of exclusive-use licensing in the CMRS bands has allowed licensees to focus on managing intra-system interference, which leads to greater efficiency. Moreover, commercial operators maximize receiver performance to maximize spectrum utilization over device cost, as spectrum is more costly than devices. There is thus no basis for regulatory mandates relating to equipment performance for commercial mobile radio systems as deployed by CTIA members in accordance with industry standards that manage receiver performance. Indeed, such mandates could deprive engineers of the flexibility needed to create innovative new products.

III. CTIA SUPPORTS EFFORTS TO ENHANCE RECEIVER PERFORMANCE.

CTIA believes that receiver performance is a key element to successful and efficient use of the electromagnetic spectrum. The wireless industry, through industry standards efforts such as those outlined above, deploys some of the most interference-resistant receivers in the world. Utilization of high-performing receivers has allowed the wireless industry to efficiently and effectively reuse scarce spectrum resources to deliver high speed data and voice services to consumers.

In contrast, receiver performance is not fully embraced by other users of licensed and unlicensed spectrum. This is primarily due to cost issues and a lack of direct effect on the parties deploying poor receivers. In these cases, deployment of new receivers is often driven by cost considerations rather than spectrum efficiency – manufacturers determine the current interference environment and attempt to utilize the lowest cost receiver possible. These cost-driven decisions often are not forward-looking, and should adjacent spectrum usage or characteristics change, these embedded, low-cost receivers may be ill-equipped to deal with raised interference levels.[5] Moreover, any receiver improvements (and associated costs) would not necessarily improve the experience of the incumbent and may raise concerns about disruption to their ongoing operations. Incumbents in other industries, therefore, may be incented to assert interference caused by new operations rather than working to develop and deploy better technology.

IV. THE TAC WHITE PAPER PROVIDES A POTENTIAL FRAMEWORK FOR ENCOURAGING RECEIVER PERFORMANCE WHERE INCENTIVES HAVE NOT SPURRED EFFICIENCY OR ACCOUNTED FOR FUTURE USES.

CTIA believes that the TAC White Paper provides a promising potential framework for encouraging enhanced receiver performance where natural, market-based incentives have failed to spur efficiency or where future uses of spectrum have not properly been taken into account. Having reviewed the TAC White Paper, CTIA believes that the proposed framework may allow wireless manufacturers and carriers to deploy technology without the need for extensive regulation. CTIA further believes that commercial mobile services could be a valuable model for such an approach.

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[5] In addition to being resistant to out of band emissions and adjacent channel interference, receivers need to be sufficiently robust to withstand harmonic and intermodulation interference.

The TAC White Paper sets forth an interference limits policy approach based on power levels called "harm claim thresholds" that a service would be expected to tolerate from other services before a claim of harmful interference could be made.[6] Manufacturers and operators would then be left to determine whether and how to build receivers that can tolerate such interference.[7] The White Paper asserts that this approach will "allow the FCC to provide guidance on the optimization of receiver performance without unduly restricting technical and commercial choice."[8] The TAC White Paper recognizes the "guiding principle" in U.S. regulation that new allocations, and in particular newly-entering transmitters, should not cause harmful interference to incumbent operations.[9]

The TAC White Paper anticipates a significant role for multi-stakeholder groups in the development of harm claim thresholds. These groups would investigate interference limits policy at suitable high-value inter-service boundaries, and could modify harm claim thresholds over time.[10] Once harm claim thresholds are adopted, a service provider can make a claim for adjacent band interference if the aggregate signal strengths from adjacent services exceed the

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6 Public Notice at 2.

7 FCC Technological Advisory Council Receivers and Spectrum Working Group, *Interference Limits Policy: The Use of Harm Claim Thresholds to Improve the Interference Tolerance of Wireless Systems*, White Paper at 3 (Feb. 6, 0213) ("TAC White Paper").

8 *Id.*

9 *Id.* at 6.

10 TAC White Paper at 13; Public Notice at 3.

ceiling specified in the harm claim threshold.[11] Once this is demonstrated, the burden would remain on the complaining party to satisfy traditional tests of harmful interference.[12]

CTIA notes that this proposed framework may allow manufacturers and wireless providers to deploy technology without extensive regulatory oversight. The harm claim thresholds would be placed upon usage of the spectrum, but parties would remain free to develop technology that could sustain (and/or reject) the levels of power that would be present in the spectrum band. Under this framework, the Commission would not be in a position to attempt to regulate receiver design or performance,[13] but instead the market would be permitted to develop appropriate methods for operations in the spectrum. Further, licensees would be best positioned to self-regulate adjacent-band and geographic use of the spectrum without FCC involvement. This is already the case in commercial mobile wireless bands such as cellular, PCS, AWS, and 700 MHz.

CTIA believes that the commercial mobile radio services could be a valuable model for the approach outlined in the TAC White Paper. Commercial mobile wireless operations are

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11 TAC White Paper at 24-25.

12 *Id.* at 25.

13 Indeed, it has very limited authority to do so. On several occasions, the Commission has questioned its own authority to regulate in this area. *See, e.g., Interference Immunity Specifications for Radio Receivers, et al.,* Notice of Inquiry, 18 FCC Rcd 6039, ¶ 22 (2003) (requesting comment on whether the Commission "has the necessary statutory authority to promulgate receiver immunity guidelines and standards" in a proceeding that was terminated without a decision); *Spectrum Policy Task Force,* Report, ET Docket No. 02-135, at 31 (2002) (recommending that Congress pass legislation to "more explicitly" grant authority to develop receiver performance standards); *Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010; Establishment of Rules and Requirements for Priority Access Service,* Second Notice of Proposed Rulemaking, 12 FCC Rcd 17706, ¶ 71 (1997) ("We observe that the Commission's authority to regulate receiver performance may be limited. . . . We request parties who favor mandatory receiver standards to address the Commission's legal authority to adopt such standards.").

governed by extensive industry-developed standards bodies. These standards bodies work to develop receiver capabilities and requirements, such as blocking requirements and other interference resistance parameters. Should the Commission move toward the harm claim thresholds model, other users of the spectrum should be encouraged to develop and use a similar process. However, CTIA would note that, given the associated costs with developing standards as well as deployment of more resistant receivers, the Commission may need to provide incentives to some industries to spur this discipline.

V. CTIA SUPPORTS THE USE OF A MULTI-STAKEHOLDER GROUP PROCESS TO EXPLORE RECEIVER PERFORMANCE APPROACHES.

In proposing the use of a multi-stakeholder group process to explore receiver performance approaches, the TAC White Paper correctly observes that the use of multi-stakeholder groups is "an efficient and effective means of addressing issues that are essential to the development of policies, rules and best practices in highly technical fields."[14] This is "especially true in fields where the technology is changing rapidly and the policy-maker or regulator may not have the specialized expertise and have available the range of processes necessary to expeditiously produce the desired results."[15]

CTIA is a strong supporter of the use of multi-stakeholder groups, and has a great deal of experience with them. CTIA and its member companies are actively involved in the Communications Security, Reliability and Interoperability Council ("CSRIC"), which has worked to provide optimal security and reliability of communications systems, including calls to 911 and the transition to next generation 911 architectures. Also noteworthy for its success is the Commercial Mobile Service Alert Advisory Committee ("CMSAAC"), which was created to

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14 TAC White Paper at 24.

15 *Id.*

recommend system critical protocols and technical requirements for the Commercial Mobile Alert Service.[16] Made up of representatives from a broad group of stakeholders including state and local governments, representatives of the communications industry, and national organizations, the CMSAAC was able to engage in repeated discussions and reach consensus on complex issues before submitting its recommendations to the Commission. Notably, the Commission largely adopted the CMSAAC's recommendations in its *First Report and Order* on commercial mobile alerting, demonstrating the success of this process.

Given the varied interests and the need for full engagement in the technical details of any new requirements for receivers, a multi-stakeholder group is the most logical approach to investigate the harm claim threshold approach suggested by the TAC White Paper. A multi-stakeholder group would also be the most effective in determining appropriate spectrum bands for piloting this approach, as well as setting particular parameters associated with it.

VI. CTIA BELIEVES THAT ANY INITIAL EFFORTS TO IMPLEMENT A NEW RECEIVER PERFORMANCE BENCHMARK SHOULD BE CAREFULLY TAILORED AND FOCUSED.

While CTIA is supportive of the Commission's efforts to examine a harm claim thresholds approach, the initial steps in determining its effectiveness and appropriate bands for examination should be carefully tailored. Existing CMRS spectrum allocations, where spectrum is heavily and efficiently used, are not the most appropriate place for testing these theories. Instead, CTIA suggests that the Commission should choose a single new or less efficiently used allocation (or allocations) as a pilot to test the use of harm claims thresholds.

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16 *See* Security and Accountability for Every Port Act of 2006, Pub. L. 109-347, Title VI-Commercial Mobile Alerts ("WARN Act"), sections 603(a), (d).

Such a pilot band should provide the Commission with real-world data on the effectiveness of the harm claim thresholds approach and also the parameters associated with it. Such parameters would include:

- Use of power spectral density for measurement and ease of determining if such a threshold is readily and easily measurable;
- The need for average or peak signal values/measurements;
- Any need for altitude definition for those measurements;
- The required granularity in spatial, temporal and frequency parameters;
- How the parameter values should be determined (the degree to which they need to reflect the current or future signal environment); and
- Potential enforcement mechanisms.

CTIA and its members look forward to participation in this effort, and believe that a cooperative industry effort will ensure that wireless receivers continue to maintain the high performance standards they achieve today.

VII. CONCLUSION

CTIA is confident that the wireless industry will continue to develop robust and innovative receivers in the absence of any additional regulation. However, CTIA supports receiver performance efforts and believes that the harm claim threshold approach outlined in the TAC White Paper has promise. CTIA believes the Commission should convene a multi-stakeholder group to examine the important issues raised in the TAC White Paper, and CTIA and its members look forward to being part of this process.

Respectfully submitted,

By: /s/ *Krista L. Witanowski*

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Krista L. Witanowski
Assistant Vice President, Regulatory Affairs

Michael F. Altschul
Senior Vice President and General Counsel

Scott K. Bergmann
Vice President, Regulatory Affairs

CTIA – The Wireless Association®
1400 Sixteenth Street, NW
Suite 600
Washington, DC 20036
(202) 785-0081

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